

ELEVEN NEW THRIPIDÆ (THYSANOPTERA) FROM PANAMA

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This is the fifth in a series of papers descriptive of the new Thysanoptera taken in Panama by the writer and his colleagues during the summer and fall of 1933.* As previously, the holotypes, allotypes, and a portion of the paratypes are in his collection.

Genus *Enneothrips* nov.

(εννέα, nine; θρίψ, a wood worm—in
allusion to the nine-segmented antennæ.)

Dorsal surface of head, prothorax, and sides of all excepting the more distal abdominal segments, with fine, raised, anastomosing lines. Head wider than long, somewhat excavated in front of median ocellus, so that the latter is directed nearly forward. Antennæ nine-segmented, the three distal segments forming a style; segments III and IV each with the usual U-shaped trichome and narrowed in apical portion, IV conspicuously so. Mouth-cone rather short and broad; maxillary palpi three-segmented. Prothorax without major setæ at posterior angles. Wings of normal form, with two longitudinal veins, the anterior one of which is bare in distal half save for about two setæ at tip, the posterior vein with numerous equidistant setæ. Abdomen of normal form; terga II-VIII each with a pair of approximate median setæ; II-VII at sides with transverse, anastomosing striæ, some of which are asperate, and with posterior margin behind these striæ similarly asperate; VIII with complete comb along posterior margin and with most of dorsum asperate; major setæ on segments IX and X moderately short, those on IX subapical and disposed in four pairs.

Genotype: *E. gustaviæ* sp. nov.

In the sculptured dorsal surface this genus recalls *Echinothrips* and *Cercyothrips*, but both of these have the antennæ eight-segmented. *Graphidothrips*, while having nine segments in the antennæ, has only one longitudinal vein in the fore wings and only two segments in the maxillary palpi. The number of maxillary

* The preceding papers were published in Proc. Biol. Soc. Washington, 46: 213-216 (Nov. 20, 1933), in Journ. N. Y. Ent. Soc., 41 (4): 407-434 (Feb. 6, 1934), in Proc. Biol. Soc. Washington, 47: 57-82 (Feb. 9, 1934), and in Proc. Ent. Soc. Washington, 36 (5): 111-114, Pl. 17 (May 25, 1934).

palpal segments is two in *Echinothrips* and presumably two in *Cerythrips*.

Enneothrips gustaviæ sp. nov.

(Pl. XI, figs. 1-4)

Female (macropterous).—Length about 1.1 mm. (distended, about 1.4 mm.). Color brown, with bright red pigmentation in fat-body of head, thorax, and basal segments of abdomen; femora and coxæ concolorous with body, trochanters and tarsi pale yellow, tibiæ yellow, the fore pair with a brown cloud near base, middle pair with a similarly placed cloud which is larger and darker, hind pair with middle half even more darkly brown; wings of fore pair white in basal fourth, uniform brown beyond; antennæ with segments I and II concolorous with head and with orange internal pigmentation, III pale yellowish, lightly banded with gray just beyond the narrow pedicel and lightly clouded with gray in about distal third, IV and V pale yellowish in basal two-fifths, rather abruptly dark gray beyond, IV often paler in the narrowed distal portion, VI-IX dark gray; ocellar pigmentation red or maroon.

Head (Pl. XI, fig. 1) nearly 1.3 times as wide as long, broadest across eyes, cheeks nearly straight and slightly converging to base; dorsal and lateral surfaces with distinct, dark, raised lines of sculpture which form a reticulation in front of anterior ocellus and the usual type of anastomosis on occiput; setæ pale, not conspicuous, two pairs of nearly equally spaced ones forming a nearly transverse line just in advance of attachment of median ocellus, a third pair (the interocellars) arising on a line tangent with the outer margins of ocelli, longer than the latter in diameter, and somewhat closer to posterior ocelli than to median one, a fourth pair arising almost directly behind lateral margins of posterior ocelli and somewhat closer to ocelli than the diameter of later, a fifth pair slightly posterior to the preceding and close to margins of eyes, two additional pairs on cheeks, close to eyes. *Eyes* scarcely protruding, more than one-half as long as head, about three-fourths as wide as their interval. *Ocelli* forming a nearly equilateral triangle, the posterior pair about 16 μ in diameter and 17 μ apart, the median one directed nearly forward. *Antennæ* (Pl. XI, fig. 4) with nine distinct segments, about 2.4 times as long as head, segment IV conspicuously narrowed in distal portion. *Mouth-cone* rather short and broad, slightly surpassing base of prosternum.

Prothorax (Pl. XI, fig. 1) about 0.93 as long as head, about 1.6 times as wide as long; pronotum finely cross-striate with fine, raised, dark, anastomosing lines which are interrupted by four pairs of latero-dorsal foveæ, and with numerous subequal setæ; no long setæ at posterior angles. *Legs* normal. *Wings* of fore pair (Pl. XI, fig. 2) nearly 2.6 times as long as greatest width of pterothorax and about 13 times as long as their width at middle; setæ short, those in the pale basal region nearly colorless, those in the dark portion brown; costal margin with about 28 such setæ and about 22 fringing hairs; anterior vein with 4+6 at base (the basal group in the

pale band and nearly colorless, those of the other group dark in color, separated from the first group by a short gap, and extending nearly to middle of wing) and 2 near apex of wing; posterior vein with a nearly equidistant series of about 15, all confined to dark area of wing; hairs of posterior fringe not wavy.

Abdomen of normal form; terga II-VIII (Pl. XI, fig. 3) each with a pair of approximate median setæ, those on VI about 42 μ long and 9 μ apart; terga I-VII in median half free of sculpture, at sides with sub-transverse, anastomosing striæ, these striæ asperate on the more posterior terga, posterior margins of II-VII asperate behind the sculptured lateral areas; tergum VIII with a regular, complete, fine comb on posterior margin and with most of its surface minutely asperate; segment IX with a sub-apical circlelet of eight dark brown setæ, of which the lateral pair are about 77 μ in length; segment X not divided above, with two pairs of large, dark setæ, the lateral pair about 80 μ long.

Measurements of ♀ (holotype), in mm.: Length, about 1.06 (distended, 1.39); head, length 0.119, greatest width (across eyes) 0.153, greatest width across cheeks 0.147, least subbasal width 0.140; eyes, length 0.067, width 0.046, interval 0.062; prothorax, length 0.111, width 0.182; pterothorax, greatest width 0.234; wings, length 0.602, width at middle 0.046; abdomen, greatest width 0.288; tergum VIII, length 0.071, IX 0.070, X 0.043.

Antennal segments:	1	2	3	4	5	6	7	8	9
Length (μ):	20	37	48	53	40	38	17	15	19
Width (μ):	30	26	22	20	16	17	8	7	5

Total length of antenna 0.287 mm.

Male (macropterous).—Length about 0.86 mm. (distended, about 1.00 mm.). Color paler than that of female, abdomen with segments IV and V yellow, tibiæ often clear yellow. Head about 1.35 times as wide as long, the eyes more prominent and protruding. Wings with fewer setæ and fringing hairs. Abdomen with the paired median setæ, sculpture, comb on tergum VIII, and asperæ as in female; tergum IX at sides with a pair of long, stout setæ (57 μ), on dorsum with a pair of shorter and very much slenderer setæ (43 μ), and two pairs of short stout setæ (15-17 μ), these last borne on low tubercles which form a rhomboid whose somewhat shorter anterior margin is in the same transverse line as the lateral large setæ and the long slender ones.

Measurements of ♂ (allotype), in mm.: Head, length 0.100, greatest width (across eyes) 0.135, greatest width across cheeks 0.121, least subbasal width 0.109; eyes, length 0.060, width 0.039, interval 0.055; posterior ocelli, diameter 0.016, interval 0.016; prothorax, length 0.093, greatest width 0.154; pterothorax, greatest width 0.192; fore wings, length 0.490, width at middle 0.037; abdomen, greatest with 0.175.

Antennal segments:	1	2	3	4	5	6	7	8	9
Length (μ):	20	33	38	39	35	33	14	13	17
Width (μ):	28	22	17	18	15	15	6	7	5

Total length of antenna 0.242 mm.

Described from 36 females and 7 males, Barro Colorado Island, C. Z., Panama (type locality), July 29–Aug. 14, 1933, in young terminal leaves of *Gustavia superba* (H.B.K.), collected by James Zetek, Cristobal Marquinez, and the author [Hood Nos. 1022, 1057, and 1059]; and from one male, Porto Bello, Panama, July 10, 1933, probably in flight, collected by the author [Hood No. 989].

The affinities of this species were discussed under the generic heading.

Sericothrips geminus sp. nov.

Female (macropterous).—Length about 0.93 mm. (distended, 1.1 mm.). Color of living specimens yellow, with a slightly orange cast due to internal pigmentation, the abdomen somewhat paler than head and thorax and more yellowish in last few segments (preserved specimens quickly lose some of the internal pigmentation and become nearly straw-yellow); pronotum with a light gray, obscure blotch extending across disk in front of middle, the ends of this marking broader and involving the two anterior foveæ, the two posterior foveæ on each side emphasized by similarly colored subcircular maculations; mesonotum with a light gray cloud on anterior margin; metanotum with a pair of obscure gray spots; abdomen with the usual transverse brown line at bases of terga II–VII, behind which, on either side of the body, is a gray spot, the pleuræ of the same segments each with a smaller gray spot; legs slightly paler than body, the fore tibiæ and all femora with a light gray cloud on outer surface; the fore coxæ more or less brown; wings light yellowish gray, usually with a faint gray cloud behind the three subbasal setæ situated on anterior vein and another cloud on posterior margin of wing behind the next three or four setæ, the anal area or “scale” somewhat clouded externally, the wing veins all with distinct orange pigmentation in fresh or living specimens; antennæ with segment I yellow, II grayish brown but yellowish basally, III very pale yellowish gray, with a brown ring occupying the narrow portion just beyond pedicel, IV–VIII blackish gray, with the narrowed apical portion of IV and a narrow ring immediately beyond pedicels of IV and V pale gray (nearly white); ocellar pigmentation vermilion red.

Head, in dorsal aspect when horizontal, about 1.5 times as broad across eyes as long, the cheeks roundly converging to base; occipital line about 0.23 from base of head, marked internally by a pale yellow but complete, distinct apodeme, the area in front of this apodeme very faintly striate,

that behind it somewhat more distinctly so; setæ as usual in the genus (see description of *S. sternalis*, below), except that the lateral pair in front of median ocellus is longer than the inner and measure about $50\ \mu$, the post-ocellar pair long and overlapping. *Eyes* prominent, protruding, about 0.65 as long as head, and about 0.63 as wide as their interval, which is a trifle greater than their length. *Ocelli* of posterior pair about $16\ \mu$ in diameter and $26\ \mu$ apart. *Antenna* nearly twice as long as width of head across eyes, with segments III and IV distinctly narrowed apically and urn-shaped, their sense-cones long ($47\text{--}50\ \mu$), segment IV distinctly longer than VI, which is not pedicellate, segment VIII about $13\ \mu$ long and separated from VII by an oblique suture.

Prothorax with the pronotum slightly longer than head and about 1.6 times as wide as long, with the usual raised, anastomosing, transverse lines, these very fine and close, not at all tending toward reticulation, not more closely spaced in the area of the pronotal blotch; seta at posterior angles long ($60\ \mu$), moderately heavy, and dark in color; minor setæ brown and distinct, three pairs forming a line across the large pronotal blotch. *Mesonotum* delicately but not especially closely striate at sides and anteriorly, nearly smooth elsewhere; metanotum very faintly subreticulate along median portion, faintly striate at sides. *Fore wings* about 20 times as long as width at middle; costal margin with about 27 setæ, longitudinal vein with a subbasal group of 3 followed by about 20, no additional setæ near tip of wing behind the longitudinal vein. *Legs* of normal form.

Abdomen of normal form and structure, with a complete comb on segments VII and VIII, the pubescence at sides of terga slightly brownish and readily seen, the major setæ brown and conspicuous.

Measurements of holotype (♀), in mm.: Length about 0.93 (distended, 1.09); head, length 0.100, length in front of occipital line 0.077, greatest width (across eyes) 0.153, greatest width across cheeks, 0.143; eyes, length 0.065, width 0.043, interval 0.069; prothorax, length 0.107, width 0.176; pterothorax, width 0.244; fore wings, length 0.658, width at middle 0.032; abdomen, width 0.274.

Antennal segments:	1	2	3	4	5	6	7	8
Length (μ):	23	38	58	57	46	50	11	13
Width (μ):	26	26	21	19	15	15	6	4

Total length of antenna 0.296 mm.

Described from 5 females, Barro Colorado Island, C. Z., Panama, August 9, 1933, J. D. H., on miscellaneous vegetation in an open banana plantation [Hood No. 1047].

This and *S. inversus* are the only known species of the genus which have the fourth antennal segment decidedly paler in the distal two-fifths; and, though *geminus* is in other ways closely

related to *inversus*, it may be separated readily by the stronger occipital line, the longer lateral setæ on the vertex of the head, the shorter sixth and eighth antennal segments, and the dark, evenly colored, anterior margin of the pronotal blotch.

***Sericothrips sternalis* sp. nov.**

Female (macropterous).—Length about 1.0 mm. (fully distended, 1.18 mm.). Color brown, with posterior half of dorsum and of sides of metathorax, all of abdominal tergum I excepting sides, and *all of abdominal segments VI and X, yellow*; median portion of terga II–V paler than lateral portions because of dark pubescence on the latter; terga II–VIII with the usual subbasal dark line; head brown in front of occipital line and along cheeks, somewhat paler ventrally, brownish yellow behind occipital line; pronotum brownish yellow, with a large, transverse, brown blotch whose evenly concave anterior margin is limited by a heavy black line (an apodeme) situated just in advance of middle of pronotum, its lateral and posterior margins marked by much fainter dark lines, its four corners prolonged, posterior margin deeply concave at middle, lateral margins subangulate at middle; transverse sculptural lines of pronotum blackish brown and conspicuous; legs with all coxæ brown, fore and middle femora yellow but shaded on outer surface with brown, hind femora largely brown shading to yellow in basal half or third and often at apex, remainder of legs yellow, or with fore tibiæ clouded with gray along outer surface; wings of fore pair dark brownish gray in basal seventh (inclusive of anal area or “scale”), white in the succeeding eighth, and gray-brown beyond, paler but not white at eighth tenth; antennæ with segments I–IV dusky yellowish, II often very lightly clouded with gray in basal portion, III shaded with brown in narrow portion beyond pedicel and more darkly with brown apically, IV darker than III, with its brief pedicel darker and narrow apical portion nearly blackish brown, especially along sides and narrowly across apex, V with pedicel blackish brown, a white ring just beyond, remainder of basal half dusky yellowish, shading to gray brown in apical half, VI–VIII gray-brown, usually paler than apex of IV; ocellar pigmentation red.

Head, when in a horizontal position, about twice as wide as long and nearly three times as wide as median length in front of occipital line, much broader across eyes than elsewhere, entire dorsal surface, including the area behind the occipital line, very finely and closely striate with dark raised lines, setæ as usual in the genus (i.e., four subequal and nearly equidistant ones in front of median ocellus, one pair between median and posterior ocelli on a line tangent with their outer margins, one pair just behind posterior ocelli and on a line with their outer margins, this last pair with their points just meeting, two minute pairs close to the last and to the eyes, two pairs on dorsal surface of cheeks just behind eyes, one nearly lateral pair close to middle of cheeks, and another pair ventral to and behind the last); occipital line dark and heavy, *tangent with posterior margin of eyes*. *Eyes* prominent,

protruding, pilose, somewhat shorter than their interval, the latter about 1.4 times their width. *Ocelli* 17 μ in diameter, the posterior pair 28 μ apart. *Antennæ* about 1.75 times as long as greatest width of head, segments formed much as usual in the genus, III and IV distinctly narrowed in apical portion, VI not pedicellate, its two long sense-cones attacked at sides and forming narrow, pale lines which originate at basal third of segment; setæ on III and IV, and inner dorsal seta on I, moderately strong and dark, the inner dorsal on III about 40 μ . *Mouth-cone* about 1.6 times as long as width at base, the three segments of the maxillary palpi measuring 25, 9, and 23 μ , respectively, thus totalling about 57 μ .

Prothorax with the pronotum about 1.3 times as long as head and 1.9 times as wide as long, the transverse, anastomosing lines prominent because of their dark color, more closely spaced in the area of the pronotal blotch, nowhere tending toward reticulation, those in the pale areas with numerous cross-wrinkles between them; pronotal blotch margined almost throughout with dark, apodemal thickenings, that forming its anterior margin especially heavy and usually with three pairs of setæ on or near it; one large (58 μ), dark, prominent, outstanding seta at each posterior angle of pronotum. *Mesonotum* and *metanotum* very finely and closely striate, with a very few, indistinct, accessory striæ between them; *metasternum* with the dark brown, modified portion deeply emarginate in front, the sides of the notch chitinized and forming an angle of less than 90°, the apex of the notch connected by two, dark, parallel apodemes with the origin of the metasternal furca. *Fore wings* about 20 times as long as width at middle; costal margin with about 25 setæ, longitudinal vein with a basal group of 3 followed by about 20, of which the distal ones are more widely spaced; two additional setæ near tip of wing, in a series posterior to longitudinal vein. *Legs* not markedly long and slender.

Abdomen normal, the pubescence distinct and nearly black, lacking from median portions of terga I-VII (save a minute patch at middle of basal portion of II, two or three transverse rows in the region of the dark subbasal line on III-V, and a somewhat larger subbasal patch on VI and VII), totally absent from IX, sparse and scattered on X, lacking from base and distal third of median portion of VIII; comb complete on VII and VIII, though small and very close on the former, the more basal terga (excepting I) often with patches of exceedingly minute comb in median portion; all abdominal setæ dark brown.

Measurements of holotype (♀), in mm.: Length about 1.0 (distended, 1.18); head, total median length 0.081, greatest width (across eyes) 0.165; eyes, length 0.062, width 0.048, interval 0.068; prothorax, length 0.106, width 0.202; pterothorax, greatest width 0.245; fore wings, length 0.672, width at middle 0.033; abdomen, width 0.302.

Antennal segments:	1	2	3	4	5	6	7	8
Length (μ):	23	38	56	53	43	52	12	12
Width (μ):	25	27	23	20	17	16	6	5

Total length of antenna 0.289 mm.

Male (macropterous).—Length about 0.67 mm. (distended, 0.78 mm.). Color and structure almost as in female, excepting that segment VII of the abdomen is pale like VI; and X, though somewhat paler than IX, is much darker than VI or VII; abdomen more slender than in female, normal to the genus.

Measurements of allotype (♂), in mm.: Head, greatest width 0.136; eyes, width 0.041, interval 0.055; prothorax, length 0.087, width 0.152; pterothorax, width 0.192; fore wings, length 0.504, width at middle 0.027; abdomen, width 0.158.

Antennal segments:	1	2	3	4	5	6	7	8
Length (μ):	18	33	43	47	35	42	10	10
Width (μ):	22	23	19	18	15	14	5	4

Total length of antenna 0.238 mm.

Described from 14 females and 5 males, as follows: Barro Colorado Island, C.Z., Panama, June 25, 1933, J. D. H., 7♀♀ on leaves of *Hamelia nodosa* Mart. & Gal. (determined by Dr. Paul C. Standley) [Hood No. 946]; June 26, 1933, J. D. H., 6♀♀ and 4♂♂ (including the *holotype* and *allotype*) on leaves of *Citrus limetta* Risso [Hood No. 950]; Aug. 6, 1933, J. D. H., 1♀ from miscellaneous vegetation [Hood No. 1039]. Martinique, French West Indies, March 14, 1915, Dr. C. B. Williams, 1♂ in sweepings near Fort de France [Williams No. 581].

The coloration of the body and wings, as well as many details of structure, ally this species with *portoricensis*; indeed, without careful study, it is quite likely to be confused therewith. But the characters italicized in the description above will identify it readily. Conspicuous and important is the form and structure of the metasternum, a character which has suggested the specific name.

Sericothrips burungæ sp. nov.

Female (macropterous).—Length about 1.0 mm. (distended, 1.17 mm.). *Color* of fresh or living specimens bright orange yellow, the orange shade predominating in pterothorax and continued conspicuously into wing veins (specimens in preservative quickly lose *all* of the orange cast, which is due to internal pigmentation, and become pale straw yellow); pronotum with the usual blotch fragmented, consisting of a gray-brown transverse band whose ends involve the two anterior foveæ on each side (this band with anterior margin sharply defined, darker, and curved posteriorly at middle, where it is narrow and nearly interrupted), and two very pale gray, obscure spots on each side occupying the two pairs of posterior foveæ, the anterior spot larger,

transverse, and often more or less divided into two; mesonotum shaded with gray on anterior margin and at sides, metanotum with a pair of obscure gray spots; abdomen with terga II-VII with the usual conspicuous dark brown transverse line, VIII with a short median line, those on II-VII with a brown spot behind either end, sides of segments I-VIII lightly shaded with gray; legs paler than body, femora and fore tibiæ slightly shaded with gray on outer surface; wings of fore pair light grayish yellow, with anal margin of scale shaded with gray, area behind the three subbasal setæ on anterior vein darker gray and followed by a small white spot and then by an indistinct gray cloud behind the next four or five setæ, the veins all with conspicuous orange pigmentation in fresh specimens; antennæ with segment I pale yellowish, II pale brown (in fresh material with a yellowish cast due to internal pigmentation), III pale grayish yellow, with a narrow brown line across extreme distal end of pedicel which is followed by a clear white line, the narrowed basal portion of the segment brown and its apical two-fifths lightly clouded with brown, extreme apex narrowly blackish brown, IV grayish yellow, with pedicel dark brown, apex nearly blackish brown, and distal half or more distinctly brownish, V with the brown pedicel followed by a pale line, the remainder of segment brown, becoming darker distally, its apex paler than that of III or IV and concolorous with remainder of antenna; ocellar pigmentation bright red.

Head about 1.6 times as wide as median length when in strictly dorsal aspect, much broader across eyes than across cheeks, the latter rounded anteriorly, straight and converging posteriorly; surface with indistinct transverse lines in front of ocellar area and behind occipital line, the latter distinct at sides but obsolete at middle and as far behind eyes as diameter of a facet; setæ as usual in the genus (see above description of *S. sternalis*), the postocellar pair slightly overlapping. *Eyes* prominent, protruding, about 0.82 as long as head, distinctly longer than their interval, the latter fully 1.4 times their width. *Ocelli* of posterior pair about $16\ \mu$ in diameter and $28\ \mu$ apart. *Antennæ* about 2.9 times as long as head, 1.8 times the width of head across eyes, of normal form and structure; segments III and IV slightly narrowed in distal portion, the outline of their sides concave beyond the broadest part, setæ on II-V dark brown; VI not pedicellate, its ventral sense-cone originating at basal third of segment. *Mouth-cone* scarcely attaining posterior margin of prosternum.

Prothorax with the pronotum about 1.4 times as long as head and about 1.34 times as broad as long, of the usual form, and with the usual raised anastomosing transverse lines pale, close, not tending toward reticulation; seta at posterior angles stout and dark brown, about $50\ \mu$ long. *Mesonotum* more finely striate than pronotum; metanotum transversely and finely striate at middle and base, longitudinally and more coarsely at sides. *Fore wings* about 19 times as long as width at middle; costal margin with about 28 setæ, anterior vein with a subbasal group of 3 followed by about 23; one

additional seta behind longitudinal vein near tip of wing. *Legs* of normal form, hind tibiae about 200 μ long and 28 μ wide.

Abdomen of normal form and structure, about 1.3 times as broad as pterothorax, with complete comb on terga VII and VIII; terga III-VII pubescent across base in the region of dark line; setae brown, distinct.

Measurements of holotype (φ), in mm.: Length about 1.0 (distended, 1.17); head, length 0.090, length in front of occipital line 0.074, greatest width (across eyes) 0.145, width across cheeks 0.133; eyes, length 0.067, width 0.042, interval 0.060; prothorax, length 0.125, width 0.167; pterothorax, width 0.217; fore wings, length 0.714, width at middle 0.037; abdomen, width 0.284.

Antennal segments:* ...	1	2	3	4	5	6	7	8
Length (μ):	23	35	53	46	39	45	9	12
Width (μ):	25	25	19	18	16	15	6	5

Total length of antenna 0.262 mm.

* Of paratype.

Male (macropterous).—Length about 0.8 mm. (distended, 0.88 mm.). Color and structure almost exactly as in female, except that there is no dark transverse line at base of tergum VIII of the abdomen, the lines on II-VII are less distinct and are bordered behind with gray spots only on II, and the lateral abdominal shading is wanting.

Measurements of allotype (δ), in mm.: Head, length 0.077, length in front of occipital line 0.058, greatest width (across eyes) 0.129, width across cheeks 0.114; eyes, length 0.056, width 0.039, interval 0.051; prothorax, length 0.096, width 0.129, seta at posterior angles 0.037; pterothorax, width 0.172; fore wings, length 0.672, width at middle 0.027; abdomen, width 0.150.

Antennal segments:	1	2	3	4	5	6	7	8
Length (μ):	20	32	43	40	33	40	8	10
Width (μ):	22	23	18	16	15	14	6	5

Total length of antenna 0.226 mm.

Described from 14 females and 2 males, taken on Barro Colorado Island, C. Z., Panama, Aug. 4, 1933, by the writer, all excepting two of the females from young leafy shoots of an undetermined plant [Hood Nos. 1033 and 1034].

The pale coloration, the non-pedicellate sixth antennal segment, the presence of complete transverse dark lines on the abdominal terga, the additional seta on the fore wings near their tip, and the coloration of the fourth antennal segment distinguish this species

readily from all members of its genus with the exception of *setosus* and *signifer*. The latter, described from Mexico, is clearly a larger insect, with the legs distinctly marked with darker, the seta at the hind angles of the pronotum pale instead of dark brown, and the fourth antennal segment less narrowed apically. The species *spinosus*, of the southwestern desert area of the United States, could easily be mistaken for the present one; however, its occipital line is complete and separated from the eyes by a distance about equal to twice the diameter of an eye-facet, its meso- and metanota are almost non-striate, its subbasal abdominal terga are not medially pubescent in the neighborhood of the transverse line, and the ventral sense-cone on segment VI of the antennæ originates about one-half, instead of one-third, the distance from its base.

The specific name is based upon an old Indian name of a region close to or perhaps including part of the present Barro Colorado Island.

Genus SCIRTOTHRIPS Shull

1909. *Scirtothrips* Shull, Ent. News, **20** (5): 222.

1929. *Sericothripoides* Bagnall, Bull. Ent. Res., **20** (1): 69.

In addition to the species now placed in this genus, the following belong here; type material of both is in my collection:

Scirtothrips bispinosus (Bagnall), comb. nov.; described in *Dendrothrips*; later made the type of the new genus *Sericothripoides*.

Scirtothrips andreæ (Karny), comb. nov.; described in *Anaphothrips*; possibly a synonym of *Scirtothrips dorsalis* Hood.

Scirtothrips panamensis sp. nov.

Female (macropterous).—Length about 0.7 mm. (distended, 0.8 mm.). *Color* of fresh or living specimens bright orange-yellow, due to internal pigmentation which is continued conspicuously into the wing-veins (specimens in preservative quickly lose all of the orange cast and become pale straw-yellow); front of head and front and sides of mesothorax with a faint, cuticular, gray cloud; abdominal terga II–VIII each with a dark cross-line near base, those on III–VII *nearly attaining lateral margins*, that on II finer than the others, closer to base of tergum, and often nearly or quite interrupted at middle, that on VIII shorter, broader, and darker; whole median third of III–VII occupied by a gray cloud, II more broadly but less distinctly gray, VIII and IX more or less distinctly gray at middle; sides of abdomen marked

with gray; *sterna IV-VII* each with a dark, basal cross-line, that on *VII* shorter than those on *V* and *VI*; legs yellow, somewhat shaded with gray on outer surface of femora and tibiae; wings dark gray, in fresh specimens with the veins orange, slightly paler at middle beyond scale and at apex, the setae and fringing hairs dark brown; antennae with segment I white or slightly yellowish, II rich dark brown, darker at sides, its color due to orange pigmentation beneath the gray cuticula, III-VIII nearly uniform dark gray, with pedicel of III yellowish and a pale ring just beyond pedicel of V; ocellar pigmentation bright red; setae brown.

Head broad, its greatest width (across eyes) nearly 1.9 times the median length, cheeks straight and converging posteriorly, occiput very finely and closely striate; setae small and normal in position, postocellars $14\ \mu$, arising behind and slightly laterad of posterior ocelli. *Eyes* nearly 0.7 as long as head and about 0.75 as long as their interval, the latter nearly twice their width. *Ocelli* of posterior pair about $10\ \mu$ in diameter and $25\ \mu$ apart; anterior margin of median ocellus about attaining base of first antennal segment. *Antennae* of normal form and structure. *Mouth-cone* broadly rounded, darker than rest of head in color, nearly attaining posterior margin of prosternum in non-distended specimens, its maxillary palpi three-segmented.

Prothorax nearly 1.4 times as long as head and 1.44 times as broad as long, the surface of pronotum very finely and closely cross-striate with raised anastomosing lines, except in the foveae, and with a few scattered dark setae; one major seta at posterior angles, this outstanding, blackish brown in color, and about $27\ \mu$ long; one pair of slender setae on posterior margin between the major pair, and two external pairs, both of the latter curved and appressed, the inner pair longer, darker, and stronger. *Legs* normal. *Wings* of fore pair with about 22 costal setae, anterior vein with three small setae at base, followed by three larger and more widely spaced ones, and then by three in distal half; posterior vein with two in about distal third.

Abdomen of typical form, closely pubescent at sides, with complete, fine comb on tergum VIII; dorsal pair of setae on IX and X about $37\ \mu$.

Measurements of holotype (♀), in mm.: Length about 0.67 (distended 0.78); head, length 0.065, greatest width (across eyes) 0.122, width across cheeks 0.116; eyes, length 0.045, width 0.031, interval 0.060; prothorax, length 0.090, width 0.130; pterothorax, width 0.182; fore wings, length 0.476, width at middle 0.030; abdomen, width 0.193.

Antennal segments:	1	2	3	4	5	6	7	8
Length (μ):	17	32	38	34	32	36	7	10
Width (μ):	19	23	16	17	15	15	7	4

Total length of antenna 0.206 mm.

Male (macropterous).—Length about 0.56 mm. Color and structure essentially as in female; hind femora without comb; abdomen without drepana.

Described from 5 females and 1 male, taken from miscellaneous shoots of unidentified shrubby plants growing in a banana plantation, Barro Colorado Island, C. Z., Panama, August 4 and 9, 1933, J. D. H. [Hood Nos. 1033 and 1047].

The eight-segmented antennæ, the abdominal coloration, and the relatively short seta at each posterior angle of the pronotum distinguish this species from all of its congeners with the exception of *dorsalis* and *andrewæ*. In them, however, the cross-line on abdominal sternum VII is long and nearly complete, and the dorsal cross-lines and median gray markings are far less extensive.

Anaphothrips limbatus sp. nov.

Female (macropterous).—Length about 0.85 mm. (distended, 1.02 mm.). Color dull yellowish, with obscure gray spots, several of these prothoracic and minute, metanotum with a large median one in posterior portion, abdominal segments I–VI or I–VII with a lateral pair and a large median one (the median one on tergum I somewhat the darkest), terga II–VII with a pair of round spots involving the attachments of the tergo-sternal muscles, all of these spots more or less indistinct; legs concolorous with body; antennæ with segment I pale yellowish, II brown, III and IV pale yellow in pedicel, shading to gray-brown in about distal half, each with a narrow dark chitinous transverse line just beyond the subapical setæ, the line on III darker than that on IV, the segment somewhat paler beyond it; V lighter than any except I, yellowish in basal half or more, distally shading to light gray-brown; VI–VIII dark gray-brown; wings of fore pair light yellowish brown, with a small circular clear spot at middle of basal sixth, the two longitudinal veins and the ambient vein slightly darker, the seta dark brown and conspicuous.

Head about 0.63 as long as greatest width, which is across cheeks, the latter swollen, evenly rounded to eyes and base, and distinctly serrate; frontal costa with a minute V-shaped notch; occiput with several distinct transverse anastomosing lines, ocellar region nearly smooth, vertex in front of ocelli rugulose; setæ minute, one pair arising just in front of median ocellus and as far apart as diameter of latter, a second pair directly laterad of median ocellus, a third pair directly in front of posterior ocelli, a fourth pair behind posterior ocelli, their bases about on a line with inner margins of latter and more than half the diameter of ocellus from them, a fifth pair at inner posterior angles of eyes, a sixth pair just behind eyes, close to and on the same transverse line with another pair on profile of cheeks. *Eyes* somewhat protruding, the width across them nearly equal to greatest width of head across cheeks, their length about 0.76 that of head, their width less than their interval. *Ocelli* forming an equilateral triangle, posterior pair $11\ \mu$ in diameter and $17\ \mu$ apart. *Antennæ* about 2.6 times as long as head, thoroughly typical of the genus; segments III and IV each with a forked

sense-cone which is short and inconspicuous, that on III dorso-lateral in position. *Mouth-cone* surpassing middle of prosternum; maxillary palpi three-segmented, segment I about 14 μ , II 9 μ , III 14 μ .

Prothorax fully 1.2 times the length of head, about 1.65 times as wide as long; pronotum rugulose, particularly at sides, and with numerous, short, stout, subequal setæ; no long setæ at posterior angles. *Legs* normal. *Wings* of fore pair about 2.4 times as long as greatest width of abdomen and about 13.4 times as long as their width at middle; setæ short (11 μ) and stout, conspicuous because of their dark color; costal margin with about 24 such setæ and about 17 fringing hairs; anterior vein with 4 + 4 at base and 7 or 8 nearly equidistant ones beyond; posterior vein with a series of 7-10, these nearly equidistant, commencing opposite the second series of 4 on the anterior vein, and ending before the penultimate seta of that series; anal margin of wing with about 45 fringing hairs; anal area or "scale" with the two usual, distal, ventral, converging hairs pale, and with 5 or 6 dark setæ, of which one is on the mid-line near base, and the others distal therefrom, along cubic-anal fold, the distad seta longer and stouter than the others.

Abdomen of normal form; *terga II-VII fringed posteriorly in lateral third or more with numerous, delicate, tooth like processes, VIII with complete comb of longer processes*; terga II-VIII each with a pair of long, slender setæ along mid-line, those on V-VIII farther apart, converging, and about as long as the terga themselves; laterad of these is a second series of setæ, successively longer and closer to the first series on succeeding segments; setæ on IX and X short (37-40 μ), only slightly diverging; dorsum of abdomen with fine, widely-spaced, dark anastomosing lines in the shaded areas, those on the more distal segments faintly asperate.

Measurements of ♀ (holotype), in mm.: Length about 0.85 (distended, 1.02; head, length 0.076, width across eyes 0.117, across cheeks 0.120, least width just behind eyes 0.110, least width at base 0.112; eyes, length 0.057, width 0.037, interval 0.044; prothorax, median length of pronotum 0.093, greatest width 0.154; pterothorax, greatest width 0.196; fore wings, length 0.536, width at middle 0.040; abdomen, greatest width 0.224.

Antennal segments:	1	2	3	4	5	6	7	8
Length (μ):	17	30	37	32	27	37	7	12
Width (μ):	22	23	18	19	18	17	6	4

Total length of antenna, 0.199 mm.

Male (macropterous).—Length about 0.67 mm. (distended, 0.79 mm.). Color paler than in female, with the gray spots less evident. Terga fringed as in female, and comb on VIII complete; IX with two pairs of slender, nearly parallel, equidistant setæ about 33 μ long, the median pair situated a little cephalad to the others.

Measurements of ♂ (*allotype*), in mm.: Head, length 0.070, width across eyes 0.101, across cheeks 0.101, least width just behind eyes 0.097, least

width at base 0.093; prothorax, median length of pronotum 0.080, greatest width 0.134; pterothorax, greatest width 0.170; fore wings, length 0.434, width at middle 0.031; abdomen, greatest width 0.163.

Antennal segments:	1	2	3	4	5	6	7	8
Length (μ):	15	26	29	26	25	33	5	9
Width (μ):	20	21	17	17	16	15	6	4

Total length of antenna, 0.168 mm.

Described from 16 females and 2 males, all taken on Barro Colorado Island, Canal Zone, Panama, July 29, 1933, by Sabra J. Hook, Helen H. Hood, and the writer, from flowers of *Euphorbia brasiliensis* Lam. (determined by Dr. Paul C. Standley) [Hood Nos. 1020 and 1023].

In the structure of the abdominal terga, this species suggests *A. tricolor* Moulton and *A. enceliæ* Moulton (the latter is probably a synonym of the former), but the coloration is very different, the antennæ eight- instead of nine-segmented, and there is no long seta at the posterior angles of the pronotum.

Genus *Salpingothrips* nov.

(σαλπίγξ, a trumpet; θρίψ, a wood worm—in allusion to the trumpet-shaped pronotal setæ)

Body not reticulated. Head small, wider than long, without long setæ. Antennæ eight-segmented, the two distal segments long and slender; segments III and IV with short, forked sense-cones. Mouth-cone very long and heavy, surpassing posterior margin of prosternum, its long maxillary palpi three-segmented. Prothorax long, fully 1.5 times the length of head, broadening posteriorly, front margin straight, side margins nearly so, posterior margin arcuate; posterior angles each with two, stout setæ which are broadly expanded at apex. Legs short and moderately stout. Fore wings slender, with two indistinct longitudinal veins sparsely set with minute setæ. Abdomen of normal form, not clothed with minute pubescence, but with moderately heavy, transverse, anastomosing lines; posterior margin of tergum I serrate with minute teeth, posterior margins of both terga and sterna II-VIII prolonged into a thin flange which considerably overlies the following segment; tergum X completely divided; setæ on segments IX and X short and stout.

Genotype: *S. minimus* sp. nov.

Allied to *Anaphothrips*. The long mouth-cone and peculiar pronotal setæ are distinctive.

Salpingothrips minimus sp. nov.

Plate XII, Fig. 5

Female (macropterous).—Length about 0.74 mm. (fully distended, about 0.9 mm.).—Color uniform brown, with legs yellow, the femora sometimes shaded along outer margin at base, rarely entirely brown, in which case the tibiae are shaded with brown; coxæ always brown; antennæ sometimes dark brown, with segment III paler, but usually with segments I and II brown (the latter pale distally and externally, and darkest along inner surface), III clear yellow, IV yellow but often somewhat shaded with brown distally, invariably much darkened beyond pedicel on inner surface, V yellow, with at least the pedicel and distal third or fourth distinctly brownish, VI yellow in basal half, quite abruptly dark gray-brown beyond, VII and VIII concolorous with distal portion of VI; wings usually pale yellowish, with brown fringing hairs and pale yellowish setæ, sometimes with a median brown basal streak (not involving scale) in basal fourth, rarely with this streak involving basal third of wing and basal two-fifths of scale, then with a dark band occupying fourth fifth of wing; no evident fat-body pigmentation; ocellar pigmentation red.

Head (Pl. XII, fig. 5) small, moderately long, its length about 0.76 its greatest width, which is across eyes, the cheeks subparallel and only slightly narrower, vertex transverse and sloping in front; dorsal surface with several heavy, transverse dark lines of sculpture which produce distinct indentations in the profile of the cheeks; setæ minute, two pairs (the median one larger) forming a line across head in front of anterior ocellus, one pair between posterior ocelli about on a line with their front margins, two pairs behind posterior ocelli and close to inner posterior angles of eyes, one pair on profile of cheeks, just behind eyes. *Eyes* with round, separated facets, nearly half as long as head, somewhat narrower than their interval. *Ocelli* not elevated, posterior pair about 10 μ in diameter and 16 μ apart. *Antennæ* about 2.9 times the length of head. *Mouth-cone* very long, surpassing posterior margin of prosternum; segment I of maxillary palpus 22 μ , II 19 μ , III 17 μ .

Prothorax (Pl. XII, fig. 5) long, the median length of pronotum about 1.27 times the width of head across eyes and about 0.83 its own greatest width; surface nearly smooth, with a few faint, well separated, transverse anastomosing lines, and scattered pale setæ; one pair of short but stouter setæ at anterior angles; the two major setæ at posterior angles brown, heavy, and much expanded apically, measuring 13–24 μ in length; posterior margin with three pairs of small setæ. *Fore legs* short and stout. *Wings* of fore pair about 1.7 times as long as greatest width of abdomen, with about 12 short setæ (the distal ones nearly invisible) and 6 fringing hairs on costal margin, 8 indistinct setæ on median vein (6 of them in basal half, 2 in apical sixth), 5 similar setæ on posterior vein, and 28–30 fringing hairs on posterior margin; anal area or "scale" with the two usual distal, ventral, converging hairs pale, and with five dark setæ, of which one is on mid-line one-fourth from base, and the others distal therefrom, along cubito-anal fold.

Abdomen of normal form, terga with a few dark, transverse anastomosing lines of which there are about three on each of II-VII; tergum I with posterior margin finely serrulate with acute projecting teeth, terga and sterna II-VIII prolonged into a thin flange which considerably overlies the following segment; tergum X completely divided; setæ minute, excepting on IX and X where the dorsal pairs measure 60-64 μ and about 68 μ respectively.

Measurements of ♀ (paratype), in mm.: Length about 0.74 (distended, about 0.91); head, length (middorsal) 0.064, greatest width (across eyes) 0.084, greatest width across cheeks 0.083; eyes, length 0.041, width 0.027, interval 0.036; prothorax, median length of pronotum 0.107, greatest width 0.129; pterothorax, width 0.168; fore wing, length 0.350, width at middle 0.023; abdomen, width 0.203; tergum VIII, length 0.069, IX 0.066, X 0.057.

Antennal segments:	1	2	3	4	5	6	7	8
Length (μ):	17	27	27	29	27	35	12	13
Width (μ):	20	20	17	17	15	13	5	4
Total length of antenna, 0.187 mm.								

Male (macropterous).—Length about 0.7 mm. (distended, about 0.8 mm.). Color and structure essentially as in female, the departures from above description as follows: Head perhaps longer, 0.8 as long as wide; eyes about 0.6 as long as head; posterior ocelli about 9 μ in diameter; antennæ about 2.6 times the length of head. Pronotum about 1.2 times the width of head across eyes; inner seta at posterior angles about 13 μ , outer seta about 17 μ . Abdominal sterna III-VII each with a transverse, narrow, granulate, specialized area at middle, that on V somewhat longer than the others and measuring about 46 μ transversely and 6 μ longitudinally; tergum IX with a slightly curved row of four setæ at distal third, the inner pair longer, the outer much stouter, and a pair of strong dark lateral setæ measuring 29 μ ; lateral setæ on segment X curved inward at tip, dark brown in color, 60 μ long.

Measurements of ♂ (allotype), in mm.: Length about 0.71 (distended, 0.81); head, length 0.071, greatest width (across eyes) 0.088, greatest width across cheeks, 0.089; eyes, length 0.043, width 0.027, interval 0.034; prothorax, median length of pronotum 0.103, greatest width 0.126; pterothorax, width 0.157; fore wings, length 0.343; abdomen, width 0.161.

Antennal segments:	1	2	3	4	5	6	7	8
Length (μ):	17	27	28	28	27	35	11	13
Width (μ):	20	20	16	16	15	13	5	4
Total length of antenna, 0.186 mm.								

Described from 11 females and 9 males, all taken on Barro Colorado Island, Canal Zone, Panama, August 8-14, 1933, by the author [Hood Nos. 1041, 1051, and 1057]. Most of the specimens were taken among young terminal leaves of *Cajanus bicolor*

D.C.; two came from *Machærium purpurascens* Pittier; and two were collected from plants which were too young for Dr. Paul C. Standley to place generically.

The form of the large setæ at the posterior angles of the pronotum, and the minute size, distinguish this species at once. Dr. H. Priesner studied one of the types, and agrees that the species cannot be placed in any described genus.

The long, heavy mouth-cone makes it nearly impossible to mount specimens without some distortion or deflection of the head; and it is possible that in the description and measurements of the female, the head and eyes are said to be shorter than they should be. The proportions given in the description of the head and eyes of the male are thus quite possibly correct for the female also, because the head of the allotype is more nearly in what I should consider a normal position.

The two specimens from *Machærium purpurascens* and one of those taken on undetermined plants, are much darker in coloration than the remainder of the series. Their dark femora and antennæ, and the banded wings, give them a somewhat different facies; but no structural differences can be detected. They appear to represent an environmental modification, and for that reason I see little point in giving them a distinctive name. It is possible, too, that they are older, and consequently darker, individuals of an earlier generation, and that the same coloration would ultimately be attained by the paler individuals.

Frankliniella diversa sp. nov.

(Pl. XI, figs. 5-7)

Female (macropterous).—Length about 1.0 mm. (distended, 1.3 mm.). Color brown, abdomen darker, head indistinctly paler in front of ocelli; coxæ brown, tibiæ, tarsi, and trochanters yellow, fore and middle femora yellow, clouded with brown on outer surface, hind femora brown, but paler than abdomen, narrowly yellow at tip; fore wings uniform light brown, with setæ darker; antennæ with segment I yellowish gray and much paler than II, the latter gray-brown and nearly as dark as VI-VIII, but with an orange cast due to internal pigmentation largely concentrated at tip, III bright yellow, IV yellow in pedicel, lightly clouded with brown beyond, V largely gray-brown and darker than IV, yellowish in narrow basal portion, VI-VIII dark gray-brown; ocellar pigmentation red.

Head (Pl. XI, fig. 5) about 0.72 as long as greatest width, broadest across eyes, narrowed posteriorly, cheeks nearly straight; interocellar setæ brown,

long (about $30\ \mu$), much longer and stronger than other dorsal cephalic setæ. *Eyes* about 0.65 as long as head. *Antennæ* (Pl. XI, fig. 6) about 2.25 times as long as head; *segment II* about as wide as long, inner and outer surfaces with a conspicuous bulge at middle, apex thickened and bearing a pair of heavy, conspicuous, dark brown setæ about $21\ \mu$ long; III much narrower than II, its pedicel (Pl. XI, fig. 7) with the subbasal shelf-like thickening angulate in profile, dorsum of segment with a pair of very stout black setæ about $37\ \mu$ in length. *Mouth cone* not elongated, but surpassing middle of prosternum.

Prothorax (Pl. XI, fig. 5) about 1.4 times as wide as long and 1.14 times the length of head; setæ brown, about concolorous with pronotum, anterior marginals $37\ \mu$, outer pair at posterior angles $53\ \mu$, inner $62\ \mu$; surface of pronotum with anastomosing lines pale and inconspicuous. *Wings* of fore pair with about 26 setæ and 25 fringing hairs on costal margin, 4 + 14 setæ on anterior vein, and 18 setæ on posterior vein.

Abdomen of normal form; posterior margins of most terga faintly crenulate, VIII with complete comb of fine spines arising from about 17 crenulations; setæ on IX and X dark blackish brown, dorsal pair on IX $81\ \mu$, dorsal pair on X $110\ \mu$; tergum X divided nearly to base.

Measurements of ♀ (holotype), in mm.: Length about 1.04 (distended, 1.32); head, length 0.106, greatest width (across eyes) 0.147, least width (at base) 0.130; prothorax, median length of pronotum 0.121, greatest width 0.170; pterothorax, greatest width 0.245; fore wings, length 0.644, width at middle 0.055; abdomen, greatest width 0.277.

Antennal segments:	1	2	3	4	5	6	7	8
Length (μ):	25	33	44	41	32	43	9	12
Width (μ):	30	31	20	19	17	18	7	6
Total length of antenna 0.239 mm.								

Described from 1 female taken by the writer at Porto Bello, Panama, July 10, 1933, on a dead branch [Hood No. 988].

The form of the second antennal segment is unique and should enable the species to be recognized at once. It is a member of my Group II of the genus, and in general appearance suggests *parvula*, *zeteki*, and the new species *standleyana*, described below.

***Frankliniella standleyana* sp. nov.**

Female (macropterous).—Length about 1.14 mm. (distended, 1.41 mm.). *Color* brown, abdomen darker, head darker than prothorax, all of thorax with an orange cast due to internal pigmentation; coxæ and femora brown, the fore femora yellow apically and along inner surface; tibiæ and tarsi yellow; fore wings uniform brown, with setæ darker; antennæ with segment I gray-brown, paler than head and segment II, the latter with orange pigmentation which gives it a rich brown color; III and IV bright orange-yellow, the latter

with a very slight shading of gray beyond widest portion; V yellowish, with less orange pigmentation than IV, lightly shaded with gray in about distal half; VI-VIII brownish gray, nearly as dark as II, base of VI paler and yellowish; ocellar pigmentation red.

Head about 0.73 as long as greatest width, broadest across eyes, narrowed posteriorly, cheeks nearly straight; interocellar setæ brown, long (about 49 μ), much longer and stronger than other dorsal cephalic setæ. *Eyes* about 0.63 as long as head. *Antennæ* about 2.4 times as long as head; segment II considerably thickened on dorsum at apex and distinctly produced, with a pair of prominent dark setæ about 26 μ long, *ventral surface with a heavy, dark, transverse carina near apex*; III with basal portion overlain and obscured by dorsal prolongation of II, its *pedicel with the subbasal thickening very broad* (14 μ) and angulate in profile, the segment itself nearly three times as long as wide, dorsum with a pair of strong dark setæ about 42 μ in length. *Mouth-cone* not elongated, but surpassing middle of prosternum.

Prothorax about 1.44 times as wide as long and nearly 1.1 times the length of head; setæ dark brown, anterior marginals 58 μ , anterior laterals 38 μ , outer and inner pairs at posterior angles 77 μ ; surface of pronotum with anastomosing lines pale and inconspicuous. *Wings* of fore pair with about 24 setæ and 24 fringing hairs on costal margin, 4+12-14 setæ on anterior vein, and 13-14 setæ on posterior vein.

Abdomen of normal form; posterior margins of most terga faintly crenulate, VIII with complete comb of fine spines arising from about 15 crenulations; setæ on IX and X dark blackish brown, dorsal pairs on IX and X each 100 μ ; tergum X divided nearly to base.

Measurements of ♀ (holotype), in mm.: Length about 1.14 (distended, 1.41); head, length 0.121, greatest width (across eyes) 0.165, least width (at base) 0.140; eyes, length 0.076; prothorax, median length of pronotum 0.132, greatest width 0.190; pterothorax, greatest width 0.260; fore wings, length 0.700, width at middle 0.057; abdomen, greatest width 0.298.

Antennal segments:	1	2	3	4	5	6	7	8
Length (μ):	26	40	61	52	36	51	10	16
Width (μ):	32	27	22	21	16	18	7	5
Total length of antenna 0.292 mm.								

Male (macropterous).—Length about 0.87 mm. (distended, 1.04 mm.). Color about as in female, but paler; legs yellow, femora lightly shaded with gray on outer surface; antennæ somewhat paler than in female, segment II scarcely darker than I. Head about 0.65 as long as greatest width, interocellar setæ about 42 μ ; antennæ about 2.5 times as long as head; setæ on dorsum of segment II about 24 μ long; segment III as in female. Prothorax about 1.6 times as wide as long; anterior marginal setæ 53 μ , anterior laterals 55 μ , outer pair at posterior angles 63 μ , inner pair 69 μ . Abdomen narrow; sterna III-VII each with a sensory area which is transversely elongate and narrowed at middle, those on IV and V subequal, about 74 μ in their longest

dimension, $14\ \mu$ broad near ends, and $9\ \mu$ across middle; sensory areas on other sterna somewhat shorter; tergum VIII without comb, but with irregular, pointed projections; tergum IX with two pairs of short ($17\text{--}20\ \mu$), stout, dark setæ behind middle, the inner pair more posterior than the lateral pair; setæ at sides of segments IX and X curved and nearly black, each pair $74\ \mu$ long.

Measurements of ♂ (allotype), in mm.: Head, length 0.098, greatest width (across eyes) 0.151, least width (at base) 0.130; eyes, length 0.063; prothorax, median length of pronotum 0.110, greatest width 0.177; pterothorax, greatest width 0.224; fore wings, length 0.574, width at middle 0.043; abdomen, greatest width 0.182.

Antennal segments:	1	2	3	4	5	6	7	8
Length (μ):	20	35	52	44	32	47	9	12
Width (μ):	30	26	21	18	15	18	7	5
Total length of antenna 0.251 mm.								

Described from 1 female and 1 male, both taken by the writer on Barro Colorado Island, Canal Zone, Panama, the female in a flower of *Clibadium surinamense* L., July 4, 1933 [Hood No. 977], the male on a flower bud of *Conostegia speciosa* Naud., August 1, 1933 [Hood No. 1029].

The character of the base of the third segment of the antenna distinguishes this species from all other members of Group II of the genus. It is named after Dr. Paul C. Standley, whose manuals on the *Flora of the Panama Canal Zone* and *The Flora of Barro Colorado Island*, Panama, have made it possible to gain in the field a knowledge of some of the food plants of the Thysanoptera, and whose careful determination of the plant specimens have furnished much accurate data for the present series of papers.

Frankliniella pulchella sp. nov.

Female (macropterous).—Length about 1.4 mm. (distended, about 1.7 mm.). *Color* dark brown, with bright *vermilion* fat-body pigmentation in thorax; *legs* very pale grayish yellow, with hind femora brown and the other femora (occasionally the tibiæ also) lightly shaded with gray on outer surface; antennæ with segments I and II dark brown and nearly concolorous with head, the apex of II paler, III grayish yellow, paler basally, IV–VIII much darker than III, but much lighter than I and II, pale gray in color, the basal portion of IV paler, especially so at distal end of pedicel, V with pedicel dark and a pale cross-line at end of pedicel; wings of fore pair brown with a small pale spot before basal fourth; setæ on body and wings nearly black.

Head long, its greatest width across cheeks negligibly greater than its

length (this in specimens mounted so that the posterior margin of the head is a straight line in dorsal aspect; in specimens with the head tipped downward the length is of course apparently much less), but broader across eyes than across cheeks, the latter broadest just behind eyes, thence straight and converging to base; vertex sloping evenly downward, frontal costa narrow, not notched; *interocellar setæ especially long* ($70\ \mu$) and prominent, situated midway between median and posterior ocelli on a line connecting their centers; other dorsal and lateral cephalic setæ minute, one approximate pair directly in front of anterior ocellus, another close to eyes directly laterad of median ocellus, and six pairs margining eyes behind posterior ocelli, two of these close to the ocelli, one behind middle of eyes, one (the longest, $18\ \mu$) on widest portion of cheeks, the other two respectively above and below this last; dorsal surface with a moderately strong, dark, transverse, occipital line and several fine anastomosing lines which produce a faint serration of the cheeks. *Ocelli* of posterior pair $18\ \mu$ in diameter and $27\ \mu$ apart. *Antennæ* fully 2.2 times as long as head and *particularly slender*, segment III being fully three times, and VI nearly four times, as long as wide; *IV decidedly shorter than III or VI*; III with subbasal thickening not abrupt and not appearing in profile as a sharp angulation on each side of pedicel; forked sensecones on III and IV long, that on IV about attaining middle of V. *Mouth-cone* long, about attaining posterior margin of prosternum.

Prothorax about as long as least basal width of head and 1.35 times as wide as long, its surface with a few faint anastomosing lines and a very few minute setæ, its extreme posterior margin with a narrow, dark, chitinous, internal thickening and only two or three pairs of minute setæ; *major setæ long and prominent, the anterior marginals about $73\ \mu$, anterior laterals and the two pairs at posterior angles about $100\ \mu$* . *Wings* of fore pair with about 22 long setæ on costal margin, anterior vein with one minute seta near base followed by three successively longer ones and then by 14-17 which are somewhat shorter, posterior vein with 13 or 14 of which the distal one is longest.

Abdomen of normal form and structure; tergum VIII with comb on posterior margin complete but very delicate, short, and sparse; tergum X divided in somewhat more than distal half; dorsal pair of setæ on IX about $154\ \mu$, on X about $168\ \mu$.

Measurements of holotype (\varnothing), in mm.: Length about 1.43 (distended, 1.76); head, length 0.166, width across eyes 0.180, width across cheeks 0.169, least width at base 0.157; prothorax median length of pronotum 0.158, width 0.213; pterothorax, width 0.312; fore wings, length 0.896, width at middle 0.061; abdomen, width 0.370.

Antennal segments:	1	2	3	4	5	6	7	8
Length (μ):	31	47	73	65	45	70	14	23
Width (μ):	36	29	23	22	16	18	8	5

Total length of antenna, 0.368 mm.

Male (macropterous).—Length about 1.0 mm. (distended, about 1.2 mm.). Smaller and more slender than female, and somewhat paler in color, with all legs beyond the brown coxæ very pale, uniform yellowish, the hind femora not dark; antennæ with the two basal segments about concolorous with head (excepting the paler apex of II, as in female), but with III–V concolorous with the very pale legs save only the slightly grayish, narrowed distal portion of IV, and the darker pedicel and distal third of V; VI–VIII light gray, VI with a dark line across base and paler basally; fat-body pigmentation brilliant vermilion; fore wings colored as in female; body and wing setæ dark blackish brown. Sterna III–VII each with the usual, transverse, pale sensory area at middle; tergum IX with inner and more posterior pair of major setæ 27 μ and stouter than the longer (67 μ) outer pair, its lateral setæ 103 μ ; lateral setæ on segment X about 89 μ .

Measurements of allotype (σ), in mm.: Head, length (when horizontal) 0.136, width across eyes 0.168, width across cheeks 0.153, least width at base 0.135; interocellar setæ, length 0.053; prothorax, median length of pronotum 0.133, width 0.187; anterior marginal setæ 0.038, anterior laterals 0.080, outer pair at posterior angles 0.080, inner pair 0.075; pterothorax, width 0.231; fore wings, length 0.648; abdomen, width 0.195.

Antennal segments:	1	2	3	4	5	6	7	8
Length (μ):	28	43	70	59	44	63	12	17
Width (μ):	32	27	18	18	14	17	7	5

Total length of antenna, 0.336 mm.

Described from 36 females and 9 males, all taken on Barro Colorado Island, C. Z., Panama, July 25–December 29, 1933, by Silvestre Aviles, James Zetek, and the author, in flowers of *Adenocalymna flos-ardeæ* Pittier, *Passiflora menispermifolia* H.B.K., *Drymonia spectabilis* H.B.K., *Bixa Orellana* L., *Clitoria arborescens* Ait., and on an unidentified bignoniaceous plant [all determinations by Dr. Paul C. Standley].

This belongs in the so-called Group III, or *intonsa* group, of the genus. The long interocellar and reduced postocular setæ would appear to ally it closely with the Brazilian *speciosa* described by Moulton. The coloration, however, is very different and the sixth antennal segment is much longer, as are also the setæ on the anterior angles of the prothorax. The italicized parts of the description above emphasize the differences between it and *speciosa*. In life it is a very pretty insect with its pale legs and antennæ and the bright vermilion, internal pigmentation. It is common in the flowers of a number of typical rain-forest plants.

***Isochætothrips striatus* sp. nov.**

(Pl. XII, figs. 1-4)

Female (macropterous).—Length about 1.2 mm. (distended, about 1.6 mm.). Color light brown, abdomen somewhat darker distally, head darker in occipital region but pale in front of ocelli, pterothorax somewhat paler than remainder of body, it and prothorax with orange pigmentation; legs much paler than body, femora and tibiæ (particularly those of hind pair) shaded with brown; antennæ with segments I and II dark brown, II with orange pigmentation at tip, III yellow basally, shading to brown before middle, the narrowed apical portion yellow, IV and V yellow in about basal third, remainder of antenna brown, pedicels of III-V slightly clouded with darker; wings of fore pair light brownish in basal third, darkest just beyond, becoming paler in apical portion, their setæ brown; ocellar pigmentation deep red.

Head (Pl. XII, fig. 1) rather long, its greatest width, which is across eyes, less than 1.2 times the mid-dorsal length, somewhat excavated between eyes in front of median ocellus; cheeks nearly straight, abruptly incised at eyes, and converging posteriorly; *entire dorsal and lateral surfaces very closely set with fine, transverse, anastomosing lines, these averaging about 2 μ apart* and producing a minute but deep serration of the cheeks; frontal costa narrowly but sharply notched; cephalic setæ small, one pair in front of median ocellus and close to mid-line, a second pair close to inner margins of eyes and somewhat in advance of attachment of median ocellus, a third pair about midway between anterior and posterior ocelli and on a line tangent with their outer margins, a fourth pair nearly directly behind middle of posterior ocelli, and five pairs of postocular setæ, of which the innermost is longest (23 μ) and close to its neighbor, the others on cheeks, one of them below the profile. *Eyes* somewhat protruding and prominent, coarsely faceted and strongly pilose, about seven facets only forming the lateral profile, their length about 0.6 that of head, their width more than 0.8 their interval. *Ocelli* subequal in size, 20 μ in diameter, the median one directed nearly forward, interval between posterior pair about equal to their diameter. *Antennæ* more than 2.3 times as long as head, segment III decidedly narrowed at apex, its forked trichome moderately long and subequal to that on IV, outer sense-cone on VI stout and very short, inner one on VI about attaining tip of VIII, this last segment much longer than VII; microtrichia on II-VI long and conspicuous. *Mouth-cone* somewhat surpassing middle of prosternum.

Prothorax (Pl. XII, fig. 1) only slightly shorter than head, its surface, like that of head, *very closely and finely transversely striate with anastomosing lines* (Pl. XII, fig. 3) and with a number of small pale setæ; posterior angles with one pair only of strong setæ, these dark brown and 37-50 μ long, the outer pair smaller (21 μ) and paler; posterior margin with three pairs of setæ between the large pair at posterior angles. Meso- and meta-nota even more finely striate than pronotum. *Legs* normal. *Fore wings* (Pl. XII, fig. 2) with about 32 setæ on costal margin, 23-30 on anterior

vein (6 or 7 of them often forming a separate group at base), and 15-19 on posterior vein.

Abdomen of normal form; sides only of terga I-VIII (Pl. XII, fig. 4) striate with oblique lines, one pair of these lines on terga III-VIII bearing a distinct comb in a portion of its length; posterior margins of terga II-VII at extreme sides with a similar comb; tergum VIII with a strong, regular, complete comb on posterior margin, the teeth about $27\ \mu$ long; abdominal setæ brown, the dorsal pair on tergum IX $90\ \mu$, dorsal pair on X $108\ \mu$, the latter sclerite divided in distal half or more.

Measurements of holotype (φ), in mm.: Length about 1.22 (distended, 1.55); head, length 0.130, width across eyes 0.152, width at posterior edge of eyes 0.137, width across cheeks 0.147, width at base 0.131; eyes, length 0.079, width 0.048, interval 0.058; prothorax, median length of pronotum 0.126, greatest width 0.170; pterothorax, greatest width 0.260; wings, length 0.812, width at middle 0.053; abdomen, greatest width 0.286.

Antennal segments:	1	2	3	4	5	6	7	8
Length (μ):	25	40	67	59	40	56	8	13
Width (μ):	31	27	22	21	18	19	10	6
Total length of antenna 0.308 mm.								

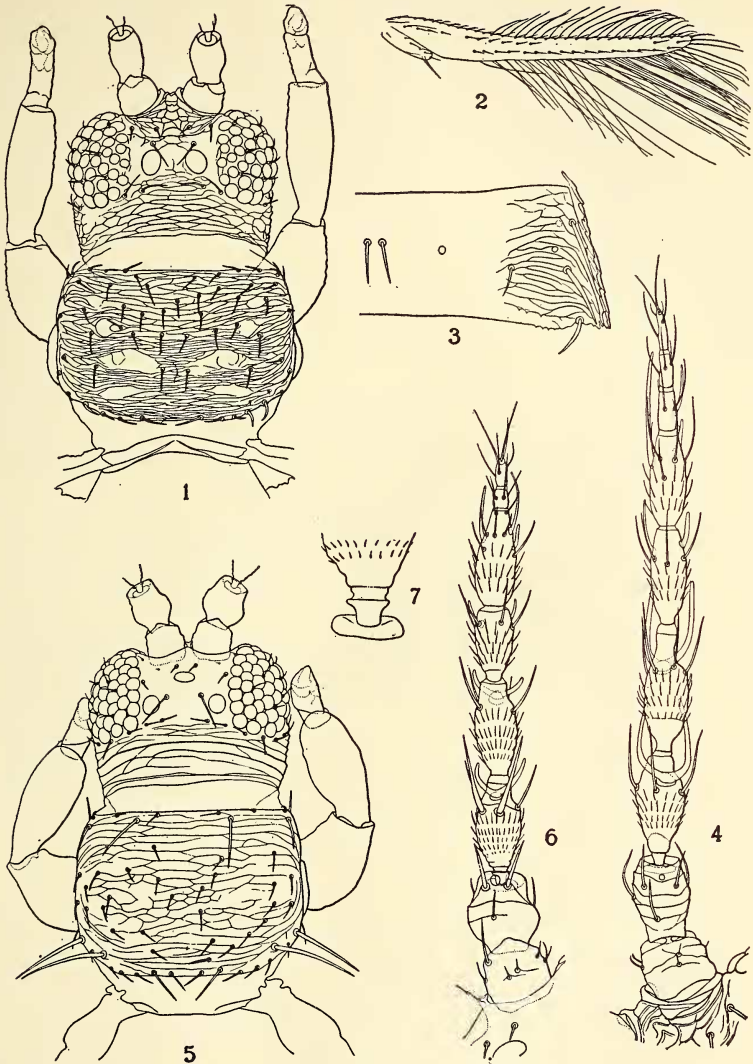
Described from 4 females taken by Silvestre Aviles on Barro Colorado Island, Canal Zone, Panama, October, 1933, in flowers of *Coutarea hexandra* Jacq. (Schum.) (determination by Dr. Paul C. Standley) [Hood No. 1077].

The closest ally of this species is doubtless *I. dampfi* Priesner, described from Mexico, with which it agrees in the closely striate head, pronotum, mesonotum, and metanotum, and the smaller size of the outer seta on the posterior angles of the prothorax. Dr. Priesner, who has kindly compared one of my specimens with his types of *dampfi*, states that *striatus* is "smaller . . . , outer prothoracic bristles rather weak, certainly a different species."

Plates drawn by Mrs. Philip T. Bassett (Helen E. Rearwin); *camera lucida*.

PLATE XI

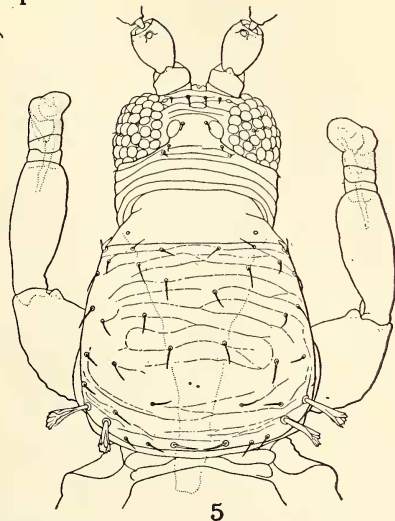
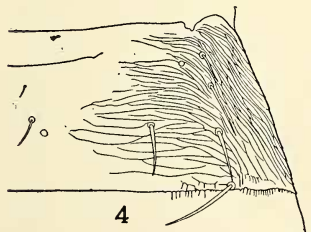
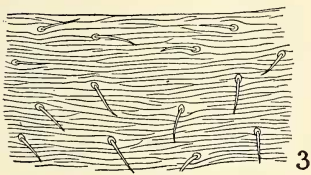
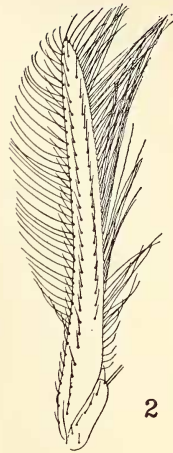
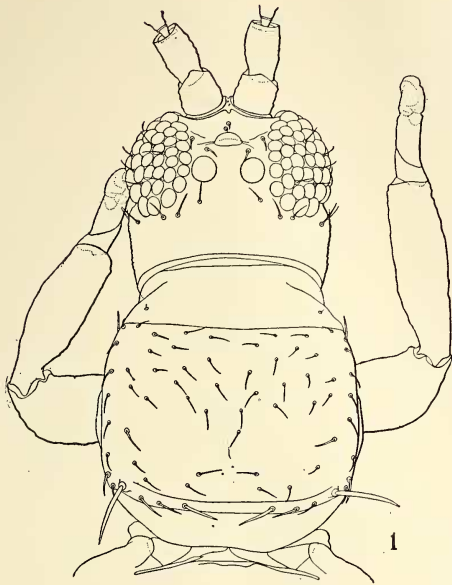
- Figure 1. *Enneothrips gustaviae* gen. et sp. nov., head and prothorax, ♀, paratype; all setæ and sculpture omitted from appendages.
- Figure 2. *Enneothrips gustaviae*, right fore wing, ♀, holotype.
- Figure 3. *Enneothrips gustaviae*, right half of abdominal segment II, dorsal aspect, ♀, paratype.
- Figure 4. *Enneothrips gustaviae*, right antenna, ♀, holotype.
- Figure 5. *Frankliniella diversa*, sp. nov., head and prothorax, ♀, holotype; all setæ and sculpture omitted from appendages.
- Figure 6. *Frankliniella diversa*, right antenna, ♀, holotype.
- Figure 7. *Frankliniella diversa*, basal portion of segment III of right antenna, ♀, holotype.



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PLATE XII

- Figure 1. *Isochætothrips striatus* sp. nov., head and prothorax, ♀, paratype; all setæ omitted from appendages.
- Figure 2. *Isochætothrips striatus*, right fore wing, ♀, paratype.
- Figure 3. *Isochætothrips striatus*, sculpture of median anterior portion of pronotum, ♀, paratype.
- Figure 4. *Isochætothrips striatus*, right half of abdominal segment II, dorsal aspect, ♀, paratype.
- Figure 5. *Salpingothrips minimus* gen. et sp. nov., head and prothorax, ♀, paratype; all setæ omitted from appendages.



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